

## DIRECTED EVOLUTION OF ARTIFICIAL METALLOENZYME – IN VIVO CATALYSIS

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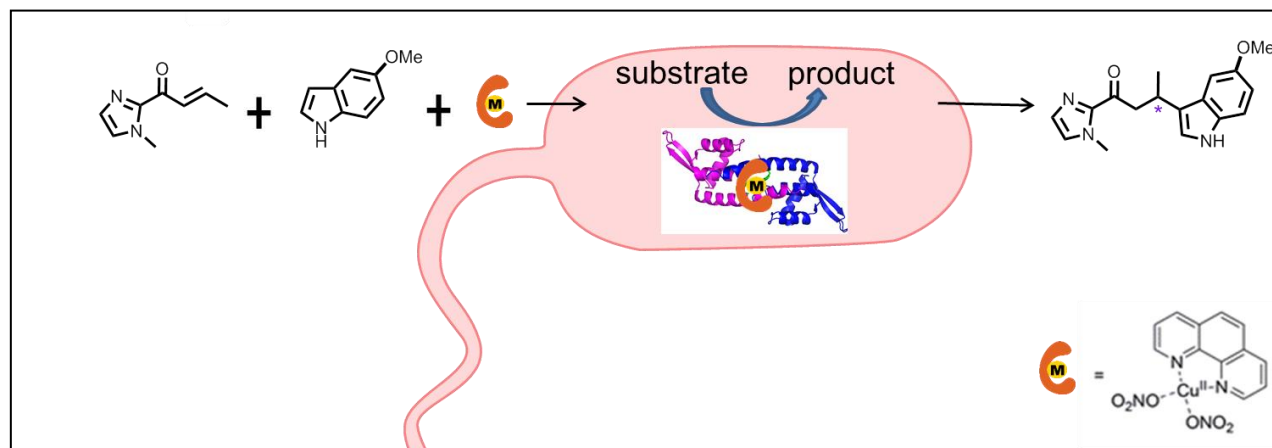


Figure 1 – ArMs catalyzed *in vivo* reaction

There is a growing interest in implementing organometallic catalysis in the context of synthetic biology for sustainable production of chemicals. Some of the recent achievements in this field include development of bio-compatible cyclopropanation by Arnold and Balskus groups[1,2]. As a first step towards interfacing microbial metabolism we aim to utilize Artificial metalloenzymes (ArMs) to perform catalysis in the cell to augment cellular bio-synthesis. Integrating ArMs catalyzed reactions in cells also provides a springboard to apply Darwinian evolution to improve the performance of these primordial enzymes[3].

ArMs are a blend of homogeneous and enzymatic catalysts. The Roelfes group has focused on the Lactococcal multi-drug resistance regulator, a transcription factor with a large hydrophobic pocket, to create a novel class of ArMs by using diverse anchoring strategies including covalent, supramolecular and biosynthetically incorporated unnatural amino acid (UAA) [4,5]. Here we will show you our progress towards achieving catalysis by ArMs in living cells.

### References

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